Amendments to the Claims*

This listing of claims will replace all prior versions, and listings of claims in the application.

1-37. (cancelled)

38. (currently amended) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

a. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 689 in SEQ ID NO:85;

b. a polynucleotide sequence encoding a polypeptide comprising amino acids from about 1 to about 689 in SEQ ID NO:86;

c. a polynucleotide sequence encoding a polypeptide that is at least 95% identical to the polynucleotide sequence of (a) or (b); and

d. a polynucleotide sequence fully complementary to the polynucleotide sequence of (a), (b) or (c) encoding a polypeptide,

wherein said polypeptide methylates DNA in an *in vitro* assay.

39. (previously presented) The nucleic acid molecule of claim 38, wherein said polynucleotide is that of part (a).

40. (previously presented) The nucleic acid molecule of claim 38, wherein said polynucleotide is that of part (b).

* The claims presented here, presume that the Amendment filed March 20, 2007 was entered.

41. (previously presented) The nucleic acid molecule of claim 38, wherein said polynucleotide is that of part (c).

42. (previously presented) The nucleic acid molecule of claim 38, wherein said polynucleotide is that of part (d).

43-44. (cancelled)

45. (previously presented) A method of making a recombinant vector comprising inserting an isolated nucleic acid molecule of Claim 38 into a vector selected from a group consisting of:

a. a DNA vector; and

b. an RNA vector.

46. (previously presented) A recombinant vector comprising the isolated nucleic acid molecule of Claim 38.

47. (currently amended) A method of making [[a]] an isolated recombinant host cell comprising introducing the recombinant vector of Claim 46 into [[a]] said host cell.

48. (currently amended) [[A]] An isolated recombinant host cell comprising the vector of Claim 46.

49. (currently amended) A method for producing a *de novo* DNA cytosine methyltransferase polypeptide, comprising culturing the isolated recombinant host cell of Claim 48 under conditions such that said polypeptide is expressed and recovering said polypeptide.

50. (cancelled)

51. (currently amended) An isolated nucleic acid molecule comprising a polynucleotide selected from the group consisting of:

a. a polynucleotide sequence encoding mouse Dnmt3a2 polypeptide contained in ATCC Deposit No. PTA-4611;

b. a polynucleotide sequence encoding human DNMT3A2 polypeptide contained in ATCC Deposit No. PTA-4610;

c. a polynucleotide sequence encoding a polypeptide at least 95% identical to the polynucleotide sequence of (a) or (b); and

d. a polynucleotyide sequence fully complementary to the polynulceotide sequence of (a), (b) or (c) encoding a polypeptide,

wherein said polypeptide methylates DNA in an *in vitro* assay.

52. (previously presented) The nucleic acid molecule of claim 51, wherein said polynucleotide is that of part (a).

53. (previously presented) The nucleic acid molecule of claim 51, wherein said polynucleotide is that of part (b).

54. (previously presented) The nucleic acid molecule of claim 51, wherein said polynucleotide is that of part (c).

55. (previously presented) The nucleic acid molecule of claim 51, wherein said polynucleotide is that of part (d).

56. (previously presented) The nucleic acid molecule of claim 38, wherein said nucleic acid molecule is expressed in embryonic stem cells.

57. (previously presented) The nucleic acid molecule of claim 51, wherein said nucleic acid molecule is expressed in embryonic stem cells.